FEASIBILITY STUDY

US 311
From the South City Limits of Walkertown to US 220 Bus./NC 704 in Madison
Forsyth, Stokes, and Rockingham Counties
Transportation Improvement Program Project R-2313

Prepared by the
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The subject project is included in the 1988-1996 Transportation Improvement Program for feasibility study and/or right-of-way protection. This report presents a brief analysis of possible improvements for US 311. The project is not currently funded. The location of the project is shown on Figure 1.

The primary purpose of the study was to evaluate the provision of a multi-lane facility from Walkertown to Madison. The NCDOT has determined that it would be feasible and desirable to provide a multi-lane US 311 facility from the south city limits of Walkertown (approximately 0.2 mile south of NC 66) in Forsyth County to the US 220 Bus./NC 704 junction in Madison in Rockingham County. Along the majority of the proposed project, the improved facility would consist of four, 12-foot lanes of travel with 10-foot usable shoulders (2 feet paved). The north and south-bound lanes would be separated by a 30- or 46-foot grassed median. Within the urban boundary of Madison, US 311 is proposed to be widened to five-lanes, curb and gutter (64 feet face-to-face of curbs). Also, the US 311 facility is proposed to be relocated to the west of both Walkertown and Walnut Cove (see Figure 3). It is further proposed to elimininate all curves of 4-degrees or greater, where feasible. The project, as it is proposed, is approximately 24.1 miles in length.

The multi-lane improvements are desirable to improve traffic flow and safety. Furthermore, the improvements are warranted to provide additional capacity for increasing volumes of traffic.

I. NEED FOR THE PROPOSED PROJECT

A. LOCATION AND TYPE OF FACILITY

The section of US 311 covered in this study begins at the south city limits of Walkertown and ends at the US 311/US 220 Bus./NC 704 junction in Madison. This section of US 311 is about 24.0 miles in length and traverses Forsyth, Stokes, and Rockingham Counties (see Figure 1).

The segment of US 311 from Walkertown to the north city limits of Walnut Cove is classified as a minor arterial route in the North Carolina Functional Classification System, and from Walnut Cove to the end of the project, US 311 is classified as a major collector route. In addition, US 311 is a part of the Federal-Aid Primary and Secondary Systems, designated FAP 103-1 from Walkertown to Walnut Cove, and FAS 8034 from Walnut Cove to the end of the project.

B. HISTORICAL BACKGROUND

The subject section of US 311 was constructed during 1920's as a 16 to 18-foot Portland cement concrete road. During the 1950's, this section of US 311 was resurfaced with asphalt, and the majority of this section was widened to 20

to 24 feet. Since the 1950's, the only major improvements to the route have been periodic resurfacing.

C. CHARACTERISTICS OF THE EXISTING FACILITY

1. Cross-Section Description

The subject section of US 311 consists primarily of two lanes with 18 to 24 feet of pavement and 6 to 9-foot grassed shoulders. However, within the city limits of Walnut Cove, the US 311 roadway varies from 20 feet to 34 feet (some sections have 5-foot shoulders, others have curb and gutter), and within Madison, the pavement width varies from 22 to 44 feet (some sections have 5 to 7-foot shoulders, others have curb and gutter). Also within Madison, from Penn Street to the US 311/US 220 Bus./NC 704 junction, the pavement is stripped for three lanes with the center lane devoted to turning traffic.

It should be noted that the riding surface is currently in bad condition throughout the length of the project.

2. Right-of-Way

The right-of-way width along this project varies as follows:

From Walkertown to the Forsyth/Stokes County Line: 60 feet

From the Forsyth/Stokes County Line to Walnut Cove: 100 feet

Within Walnut Cove: 60 feet

From Walnut Cove to the end of the project: 100 feet

3. Horizontal and Vertical Alignment

Rolling terrain exists throughout the entire length of the subject section of US 311. The existing vertical and horizontal alignments are judged to be poor with 36 curves ranging from 3 to 32-degrees, and grades ranging from -7-percent to +7-percent. Approximately 30-percent of the subject segment affords adequate passing sight distances of 1500 feet or more (Figures 2-A through 2-E offer Photos of the Existing Conditions along the subject section of US 311).

4. Speed Limit

The posted speed limit along the majority of the subject section of US 311 is 55 mph. However, near and within the various urban areas along the project, the posted speed limits vary from 25 mph to 45 mph.

5. Degree of Roadside Development and Abutting Properties

Roadside development is primarily moderate to heavy and rural residential in nature. However, development is extremely heavy in and near Walkertown, Walnut Cove, and Madison with substantial residential and commercial development evident. Table 1, on the following page, provides

a summary of the total number of properties that either front and/or have driveway connections to the US 311 facility.

TABLE 1

NUMBER OF ABUTTING PROPERTIES ALONG US 311

LOCATION	DIRECTION	NUMBER OF RESIDENCES	NUMBER OF BUSINESSES	RESIDENTIAL DENSITY (HOMES/MILE)	BUSINESS DENSITY (BUSINESSES/MILE)
INSIDE WALKERTOWN (1.8 MILES)	NORTH-BOUND	24	15	13.33	8.33
	SOUTH-BOUND	17	22	9.44	12.22
WALKERTOWN TO WALNUT COVE (7.3 MILES)	NORTH-BOUND	17*	4	2.32	0.55
	SOUTH-BOUND	84*	9	11.51	1.23
INSIDE WALNUT COVE (3.0 MILES)	NORTH-BOUND	43	25	14.33	8.33
	SOUTH-BOUND	35	35	11.67	11.67
WALNUT COVE TO MADISON (9.4 MILES)	NORTH-BOUND	72	10	7.67	1.06
	SOUTH-BOUND	69	9	7.34	0.96
INSIDE MADISON (2.5 MILES)	NORTH-BOUND	37	16	14.80	6.40
	SOUTH-BOUND	45	13	18.00	5.20

* Difference between north and south-bound reflects proximity of railroad to US 311 in this area.

6. Public Facilities

The following is a summary of the existing public facilities located within the study area, and adjacent to the US 311 roadway:

Within Walkertown:	U. S. Post Office Walkertown Community Fire Department
Between Walkertown and Walnut Cove:	Salem Chapel Volunteer Fire Dept. Fulp Moravian Church
Within Walnut Cove:	Walnut Cove Fire Dept. and Rescue Squad Southeastern Stokes Junior High School Walnut Cove Primary School First Christian Church

Between Walnut Cove and Madison:	Sycamore Baptist Church and Cemetery Grace Baptist Church Byrd's United Holiness Church
Within Madison:	Good News Baptist Church Madison United Methodist Church

7. Access Control

No control of access exists along the subject section of US 311.

8. Intersecting Roads

Within the study area, all existing roads intersect US 311 at-grade with stop sign control, except within the urban boundaries where the following intersections are controlled by signals:

INTERSECTION	TYPE OF SIGNAL
US 311 and NC 66 in Walkertown	FULL CYCLE
US 311 and 3rd Street in Walnut Cove	FULL CYCLE
US 311 and NC 89 in Walnut Cove	FULL CYCLE
US 311 and Wilson Street in Madison	FULL CYCLE
US 311 and Franklin Street in Madison	FULL CYCLE
US 311 and US 220 Bus./NC 704 in Madison	FULL CYCLE

9. Structures

(a). Drainage

There is one major drainage structure located along the subject section of US 311. The following is a brief description of this structure:

A tributary of the Dan River flows underneath US 311 through a double barrel, 10' X 10' reinforced concrete box culvert. The structure is 21 feet long; built in 1926; and has an estimated remaining life of 35 years. The structure is located at the junction of US 311 and SR 1917 northeast of Walnut Cove.

All other drainage structures located along the project consist of corrugated metal pipes used for cross-drainage.

(b). Bridge

There are nine bridges located within the project limits. The characteristics of these structures are given in Table 2 on the following page.

TABLE 2

CHARACTERISTICS OF THE EXISTING STRUCTURES

LOCATION	BRIDGE NO.	YEAR CONSTRUCTED	SUFFICIENCY RATING	ESTIMATED REMAINING LIFE	STRUCTURE LENGTH	CLEAR ROADWAY WIDTH
Norfolk-Southern Railroad, 2.1 miles north of NC 66	186	1923	unknown	1 year	27 feet	not applicable
Town Fork Creek, 0.1 mile north of NC 65	4 *	1934	41.8	10 years	292 feet	24.0 feet
Dan River Overflow, 2.6 miles north of NC 89	31	1925	63.6	10 years	209 feet	20.0 feet
Dan River, 2.8 miles north of NC 89	47	1925	49.3	14 years	315 feet	20.0 feet
Eurins Creek, 5.3 miles north of NC 89	53	1925	54.5	20 years	51 feet	20.0 feet
Rickers Branch, 1.0 mile north of NC 772	58	1925	76.6	20 years	36 feet	20.0 feet
Reed Creek, 0.8 mile west of SR 1162	27	1940	51.1	13 years	42 feet	28.1 feet
Little Beaver Island Creek, 50 feet east of SR 1138	67	1940	57.7	9 years	37 feet	25.9 feet
Big Beaver Island Creek, 158 feet east of SR 1169	95	1940	78.4	10 years	41 feet	25.9 feet

* Currently being replaced under T.I.P. Project B-1390

D. Project Terminals

Southern Terminal: The subject project is proposed to begin at the south city limits of Walkertown in Forsyth County. From this point, US 311 extends southward towards the City of Winston-Salem with a cross-section consisting of 20 feet of pavement (2 lanes) with 6-foot grassed shoulders. Within the heart of Winston-Salem, the US 311 cross-section consists primarily of two to five-lanes, curb and gutter (pavement widths vary from 34 to 72 feet). Access along this portion of US 311 is not controlled, and the right-of-way width varies from 60 to 100 feet.

Northern Terminal: The subject project is proposed to end at the junction of US 220 Bus./NC 704. At this point, the US 311 facility terminates; motorist can travel towards central and eastern Rockingham County via US 220 Bus. and NC 704.

E. Traffic Data and Capacity Analysis

Current average daily traffic (ADT) volumes within the project limits vary from a low of 2,900 vehicles per day near NC 772 to a high of 9,200 vehicles per day inside Walnut Cove. Truck traffic semi-trailer (TTST) traffic accounts for 2-percent of the overall ADT along the subject section of US 311. Additionally, dual-tired trucks (DTT) account for an average of 3-percent of the overall ADT. The year 2008 ADT are projected to vary in range from 5,200 to 16,500 vehicles per day. The existing traffic volumes as well as the 2008 projected volumes for the subject section of US 311 are shown on Figure 4.

For capacity analysis purposes, the subject section of US 311 was divided into the following five segments:

SEGMENT 1: INSIDE WALKERTOWN: (two lanes, 20 to 22-foot pavement)

SEGMENT 2: FROM WALKERTOWN TO WALNUT COVE: (two lanes, 22-foot pavement)

SEGMENT 3: INSIDE WALNUT COVE: (two lanes, 20 to 34-foot pavement)

SEGMENT 4: FROM WALNUT COVE TO MADISON: (two lanes, 20-foot pavement)

SEGMENT 5: INSIDE MADISON (TO THE END OF PROJECT): (two to tnree lanes, 22 to 44-foot pavement)

Beginning below, Table 3 provides a summary of the findings of the capacity analysis performed for these five segments of the existing US 311 roadway.

TABLE 3

CAPACITY ANALYSIS

	YEAR	AVERAGE PEAK HOUR VOLUME*	COMPUTED LEVEL OF SERVICE
SEGMENT 1:	1988	1000	E
INSIDE WALKERTOWN	2008	1300	E
SEGMENT 2:	1988	345	C
WALKERTOWN TO WALNUT COVE	2008	625	D

* MEASURED IN VEHICLES PER HOUR (VPH); TOTAL, BOTH DIRECTIONS; 60\40 TRAFFIC SPLIT WAS ASSUMED

TABLE 3, CONTINUED

CAPACITY ANALYSIS

	YEAR	AVERAGE PEAK HOUR VOLUME*	COMPUTED LEVEL OF SERVICE
SEGMENT 3:	1988	780	D
INSIDE WALNUT COVE	2008	1400	E
SEGMENT 4:	1988	355	C
WALNUT COVE TO MADISON	2008	640	D
SEGMENT 5:	1988	870	D
INSIDE MADISON	2008	1470	E

* MEASURED IN VEHICLES PER HOUR (VPH); TOTAL, BOTH DIRECTIONS; 60\40 TRAFFIC SPLIT WAS ASSUMED

The concept of levels-of-service is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. A level-of-service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels-of-service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with level-of-service A representing the best operating conditions and level-of-service F the worst.

F. Accident Analysis

An accident study of the subject project was conducted by the Traffic Studies Section of the NCDOT Traffic Engineering Branch for the period from January 1, 1984 to November 30, 1987. During this time period, a total of 226 accidents occurred along the subject section of US 311 (including 1 fatal accident). A summary of the accident data is given in Table 4.

TABLE 4

ACCIDENT DATA

Summarized Accident Statistics
For Rural Portions of US 311

	Walkertown to Walnut Cove	Statewide Averages for Similar Rural US Routes (1984-1987)
Total Accidents	47	N/A
Fatal Accidents	0	N/A
Non-Fatal Injury Accidents	31	N/A
Total Accident Rate*	129.16	200.13
Fatal Accident Rate*	0.00	3.85
Non-Fatal Injury Accident Rate*	85.19	92.75

	Walnut Cove to Madison	Statewide Averages for Similar Rural US Routes (1984-1987)
Total Accidents	53	N/A
Fatal Accidents	1	N/A
Non-Fatal Injury Accidents	23	N/A
Total Accident Rate*	73.16	200.13
Fatal Accident Rate*	1.38	3.85
Non-Fatal Injury Accident Rate*	31.75	92.75

Summarized Accident Statistics
For Urban Portions of US 311

	Within Walkertown	Statewide Averages for Similar Urban US Routes (1984-1987)
Total Accidents	30	N/A
Fatal Accidents	0	N/A
Non-Fatal Injury Accidents	14	N/A
Total Accident Rate*	4,225.35	379.05
Fatal Accident Rate*	0.00	1.25
Non-Fatal Injury Accident Rate*	1,971.83	144.47

	Within Walnut Cove	Statewide Averages for Similar Urban US Routes (1984-1987)
Total Accidents	60	N/A
Fatal Accidents	0	N/A
Non-Fatal Injury Accidents	20	N/A
Total Accident Rate*	205.69	379.05
Fatal Accident Rate*	0.00	1.25
Non-Fatal Injury Accident Rate*	68.56	144.47

* Rates are in terms of Accidents per 100 Million Vehicle Miles.

TABLE 4, CONTINUED

ACCIDENT DATA

Summarized Accident Statistics
For Urban Portions of US 311

	Within Madison	Statewide Averages for Similar Urban US Routes (1984-1987)
Total Accidents	63	N/A
Fatal Accidents	0	N/A
Non-Fatal Injury Accidents	23	N/A
Total Accident Rate*	403.33	379.05
Fatal Accident Rate*	0.00	1.25
Non-Fatal Injury Accident Rate*	147.23	144.47

* Rates are in terms of Accidents per 100 Million Vehicle Miles.

A review of the data reveals that accidents involving vehicles running-off-the-road and rear-end collisions constitute the largest percentages of the overall total amount of accidents occurring along the subject section of US 311. The type of improvements under review would help to reduce the number of these types of accidents as well as improve the overall safety of the highway.

II. DESCRIPTION OF SUGGESTED IMPROVEMENTS

A. General Description

The North Carolina Department of Transportation recommends improving US 311 to a multi-lane highway from the south city limits of Walkertown in Forsyth County to the US 220 Bus./NC 704 junction in Madison in Rockingham County. The project, as proposed, is approximately 24.1 miles in length and it traverses Forsyth, Stokes, and Rockingham Counties.

The recommended improvement are proposed to be accomplished on the majority of the project by (1) widening the existing facility to 28 feet, (2) resurfacing the existing facility, and (3) constructing a new 28-foot pavement parallel to the existing highway. The north and south-bound lanes would be separated by a 30-foot grassed median. Within the urban boundary of Madison, it is recommended that a cross-section consisting of five-lanes (64 feet of pavement) with curb and gutter be constructed. Finally, due to the predicted traffic growth and resulting congested conditions along US 311 in Walkertown and Walnut Cove, a relocated facility around the west-side of each of these areas is proposed. These facilities would also consist of four lanes; however, the median width along the bypasses would be 46 feet. In addition, all curves of 4-degrees or greater are proposed to be eliminated, where feasible. The location of the suggested improvements are shown in detail on Figure 3.

B. Summary of Recommended Action

1. Length of Subject Project

24.1 miles

2. Cross-Section Description

A four-lane, divided facility with 10-foot usable shoulders (2 feet paved) and a 30-foot grassed median is proposed for the majority of the subject section of US 311. Within the urban boundary of Madison, the existing roadway is recommended to be widened to a five-lane, curb and gutter facility. Four-lane, divided, partially controlled access bypass facilities are recommended to be located on the west-side of Walkertown and Walnut Cove. Details of the proposed cross-section are shown in Figure 6.

The four-lane divided sections are recommended to be constructed along the existing roadway in such a manner as to avoid any unnecessary displacements or right-of-way costs. This would be achieved by shifting the construction of the additional 28-foot pavement east or west of the existing roadway.

3. Relocated Segments

It is proposed to relocate US 311 to the west of both Walkertown and Walnut Cove (see Figure 3). The Walkertown Bypass would begin approximately 0.1 mile south of NC 66 and link back with the existing facility just north of the Norfolk-Southern Railroad Bridge, a distance of about 1.8 miles. The Walnut Cove Bypass would begin approximately 0.4 mile north of NC 65 and tie back into the existing facility near SR 2065, northeast of Walnut Cove, a distance of about 3.1 miles.

4. Right-of-Way

In general, it is anticipated that a total of 200-230 feet of right-of-way width would be required in order to contain the proposed four-lane, divided improvements, and a total of 80-90 feet to contain the proposed five-lane, curb and gutter improvements.

5. Access Control

Except for the proposed bypasses of Walkertown and Walnut Cove, no control of access is recommended for the subject section of US 311. The acquisition of partial control of access is proposed for the Walkertown and Walnut Cove Bypasses. For this particular project, the partial control of access would involve full control of abutting properties with designated at-grade intersections.

6. Intersection Treatment

All roads intersecting with US 311 would contact it at-grade with either stop sign or traffic signal control.

7. Terminal Treatment

Southern Terminal: The subject project is proposed to begin at the south city limits of Walkertown, (approximately 0.2 mile south of NC 66), in Forsyth County (See Figure 3). From this point, the US 311 facility extends southward towards Winston-Salem and Interstate 40. Presently, there are no major improvements programmed for this section of US 311.

6. Intersection Treatment

All roads intersecting with US 311 would contact it at-grade with either stop sign or traffic signal control.

7. Terminal Treatment

Southern Terminal: The subject project is proposed to begin at the south city limits of Walkertown, approximately 0.2 mile south of NC 66), in Forsyth County (See Figure 3). From this point, the US 311 facility extends southward towards Winston-Salem and Interstate 40. Presently, there are no major improvements programmed for this section of US 311.

Northern Terminal: The subject project would end at the junction of US 220 Bus./NC 704. At this point, the US 311 facility terminates; motorist can travel towards central and eastern Rockingnam County via US 220 Bus. and NC 704.

8. Design Speed

The utilization of a 65 mph design speed on the four-lane, divided sections, and a 55 mph design speed on the five-lane, curb and gutter sections is recommended for this project. In order to provide for these design speeds, it would be necessary to eliminate all curves of 4-degrees or greater, where feasible.

The proposed design speeds reflect the geometric design of the roadway, and they provide for a margin of safety for safe vehicular operation. They should not be confused with the posted speed limits or vehicular running speeds. It is anticipated that the proposed facility would have a 55 mph posted speed limit on the four-lane, divided sections, and a 45 mph posted speed limit on the curb and gutter sections.

9. New Structures Required

(a). Drainage Structures

The only major drainage structure located along the subject project is found at a tributary of the Dan River at the junction of US 311 and SR 1917 northeast of Walnut Cove (see Section I.C.9., Structures, on page 4). This culvert would require extension in order to accommodate the proposed cross-section.

It is anticipated that all other drainage structures used for cross-drainage could be extended to accommodate the proposed widening of the existing highway. Where new roadway construction is required, all necessary drainage features and structures would be included as an integral part of the construction.

(b). Bridge Structures

It is anticipated that the majority of the existing structures would have to be reconstructed (and widened) or replaced to provide a 38-foot wide clear roadway width. New, 38-foot wide structures would

be constructed parallel to the existing structures in order to accommodate the proposed four-lane, divided cross-sections. The Little Beaver Island and Big Beaver Island River Bridges, within Madison, would be widened to 72 feet in order to accommodate a five-lane roadway.

Along the proposed Walkertown Bypass, new bridge structures would have to be built over the Norfolk-Southern Railway (see Figure 3). For the proposed Walnut Cove Bypass, new structures would be required at Town Fork Creek, the Norfolk-Southern Railway, and Miles Creek (see Figure 3).

C. Traffic Data and Capacity Analysis

Average daily traffic (ADT) volumes, based upon the proposed improvements, are projected to vary from a low of 5,200 vehicles per day near NC 772 to a high of 13,200 vehicles per day along the proposed Walnut Cove Bypass by the year 2008 (see Figure 5). Along the improved route, truck traffic semi-trailer (TTST) traffic is projected to account for 5-percent of the overall ADT along the subject section of US 311 in 2008. Additionally, dual-tired trucks (DTT) will account for an average of 6-percent of the overall ADT.

A capacity analysis was performed in order to determine the future level of service that could be provided by the US 311 facility, based on the proposed roadway dimensions and the projected traffic volumes. For the purpose of this analysis, the subject section of US 311 was divided into the same segments shown on page 6 of this document with the exception of Segments 1 and 3, which for this analysis will be the Walkertown and Walnut Cove Bypasses, respectively. With the exception of Segment 5, the cross-section for each Segment is the same: four, 12-foot lanes, 10-foot usable shoulders (2 feet paved), 30-foot grassed median. The cross-section for Segment 5 consists of five, 12-foot lanes with curb and gutter. The results of this analysis are given below.

TABLE 5

CAPACITY ANALYSIS, BASED ON THE PROPOSED IMPROVEMENTS

	YEAR	DIRECTION	AVERAGE PEAK HOUR VOLUME*	COMPUTED LEVEL OF SERVICE
SEGMENT 1: WALKERTOWN BYPASS	2008	SOUTH-BOUND	588	A
		NORTH-BOUND	392	A
SEGMENT 2: WALKERTOWN TO WALNUT COVE	2008	SOUTH-BOUND	375	A
		NORTH-BOUND	250	A
SEGMENT 3: WALNUT COVE BYPASS	2008	SOUTH-BOUND	672	A
		NORTH-BOUND	448	A
SEGMENT 4: WALNUT COVE TO MADISON	2008	SOUTH-BOUND	384	A
	2008	NORTH-BOUND	256	A
SEGMENT 5: INSIDE MADISON	2008	SOUTH-BOUND	882	B
		NORTH-BOUND	588	A

* MEASURED IN VEHICLES PER HOUR (VPH); 60\40 TRAFFIC SPLIT WAS ASSUMED

of US 311 in the level-of-service A range for the year 2008. The level-of-service A (LOS A) is defined as free flow operation. Motorists are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist and passenger is excellent.

D. Cost Estimates

The total estimated cost for the proposed improvements is as follows:

Construction	$26,800,000
Right-of-Way	$39,500,000
Total	$66,300,000

E. Staged Construction

It may be determined that staging the proposed improvements to US 311 is the best course of action due to an accelerated construction schedule and/or funding considerations. Should staging be selected, it is recommended that the improvements be made with the following priority:

Stage 1) Construct the proposed bypasses of Walkertown and Walnut Cove, widen US 311 in Madison to five-lanes, curb and gutter, and widen the remainder of US 311 to 24 feet of pavement with 10-foot usable shoulders (2 feet paved). The estimated cost of the Stage 1 improvements is $36,740,000 ($15,300,000 for right-of-way and $21,440,000 for construction).

Stage 2) Purchase all remaining necessary right-of-way, and construct the remaining 28-foot pavement (two lanes, parallel to the existing), 10-foot usable shoulders, and the 30-foot grassed median. The estimated cost of constructing the Stage 2 improvements is $29,560,000 ($24,200,000 for right-of-way, $5,360,000 for construction).

III. ALTERNATIVES CONSIDERED

The only alternative to the recommended action that was investigated involved widening the existing US 311 facility through Walkertown and Walnut Cove. As shown on Figures 1 and 3, US 311 follows a winding, indirect path through Walkertown. Roadside development is heavy within the city limits. Widening the existing road within Walkertown (to five-lanes, curb and gutter) would result in considerable right-of-way damages, and would not allow for the elimination of the routes' indirect path, and thus this option was not given further consideration.

US 311 traverses the heart of the Walnut Cove business district, and it becomes heavily congested during daily peak travel periods. As with Walkertown, roadside development is extremely heavy along US 311 within Walnut Cove. Based on the projected traffic volumes, a facility consisting of at least five lanes, with curb and gutter would have to be provided in Walnut Cove. However, even this type of facility would result in substantial right-of-way damages, and possibly have an adverse affect upon the economy of Walnut Cove. For these reasons, widening US 311 through Walnut Cove was not judged to be a viable alternative. It is important to note that a US 311 bypass to the west of Walnut Cove would be consistent with the current Stokes County Thoroughfare Plan.

It should be noted that if the project is to be implemented at a future date, all feasible alternatives, and their associated impacts, will have to be evaluated in a planning/environmental document. Then, a final decision will be made as to the most appropriate improvements.

IV. POTENTIAL SOCIAL AND ENVIRONMENTAL IMPACTS

A. Social Impacts

The major positive social impact of the recommended action would be the potential for safer vehicular operations. In addition, the project would have a positive effect on accessibility to schools, major cities, employment centers, churches, shopping areas, hospitals, and community services. Benefits in improved accessibility and mobility would be realized by residents both within and outside the project area.

Some negative social impacts would result from the subject project, however. The primary potential adverse social consequence of constructing the project would be the resulting relatively high number of business and residential displacees. For example, between Walkertown and Walnut Cove, about 84 residences and 17 businesses could be displaced if the project was implemented. This is due to the proximity of the Norfolk-Southern Railroad on the east-side of US 311, and the prohibitive cost involved with relocating an active railroad. The total number of displacements could be high in other areas also due to the previously described heavy roadside development that exists along some portions of the project. It is estimated that Stage I would involve the displacement of 68 residences and 14 businesses. It is further estimated that Stage II would displace 190 residences and 24 businesses. Consequently, many families and businesses could be forced to move if the project is carried out. The Relocation Assistance Program of the Division of Highways includes provisions to reduce the adverse effects of displacement. These provisions would be described in detail in a planning/environmental document prior to the implementation of the project.

B. Environmental Impacts

One of the potential adverse environmental consequences of constructing the subject project would be its impact upon the area's wetlands. The subject section of US 311 crosses several watercourses, and each one could be impacted to some degree if the project is

implemented. The current water quality classifications for the streams in the study area are shown below:

WATERCOURSE	CLASSIFICATION
Town Fork Creek	C
Miles Creek	C
Dan River	A-II & C
Eurins Creek	C
Reed Creek	C
Little Bear Island Creek	C
Big Bear Island Creek	C

A Class A-II water quality indicates water suitable for a source of drinking water (the Dan River does serve as a drinking water source for Rockingham County). A Class C water quality rating indicates the water is suitable for fishing and fish propagation, and other usages requiring water of lower quality.

The project would infringe upon wetlands classified as bottomland and riparian hardwoods. Section 404 of the Clean Water Act, as amended, permits would have to be obtained before project construction.

Additionally, the subject project lies within the known geographical range of the red cockaded woodpecker (Picoides borealis), a species listed as threatened and/or endangered by the U. S. Fish and Wildlife Service.

Because of the proximity of the proposed Walnut Cove Bypass to the Meadow Brook Airfield (see Figure 3), the NCDOT would have to coordinate the project with the appropriate Federal and State Aviation officials prior to implementing the project.

Considering that the proposed improvements would include the construction of two, partially controlled access bypasses, and based upon current Federal and State environmental regulations, it is reasonable to assume that the preparation of an Environmental Impact Statement (EIS) would be required, in order to document the potential social and environmental consequences of implementing this project.

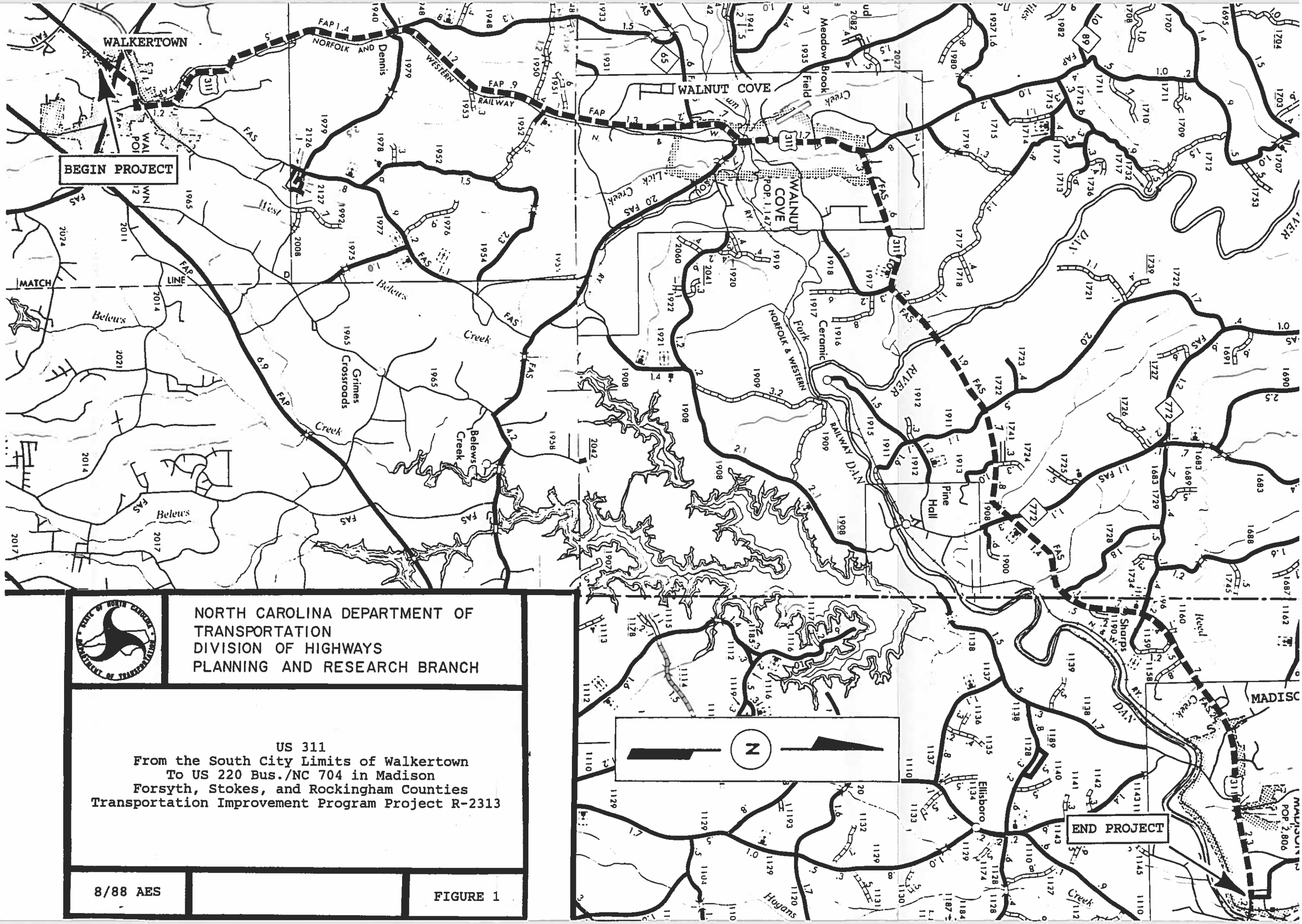
V. BASIS FOR FINDINGS

The recommendations contained in this report were based on the following:

1. Field Investigations
2. Correspondence with the Board of Transportation Members
3. Correspondence with the Division of Engineers
4. Aerial Mosaic dated July, 1988
5. Cost estimates provided by the Right-of-Way Branch and Design Services Unit

As previously mentioned, if the project is to be implemented at a future date, all feasible alternatives, and their associated impacts, will have to be evaluated in a planning/environmental document. Then, a final decision will be made as to the most appropriate improvements.

TVS/

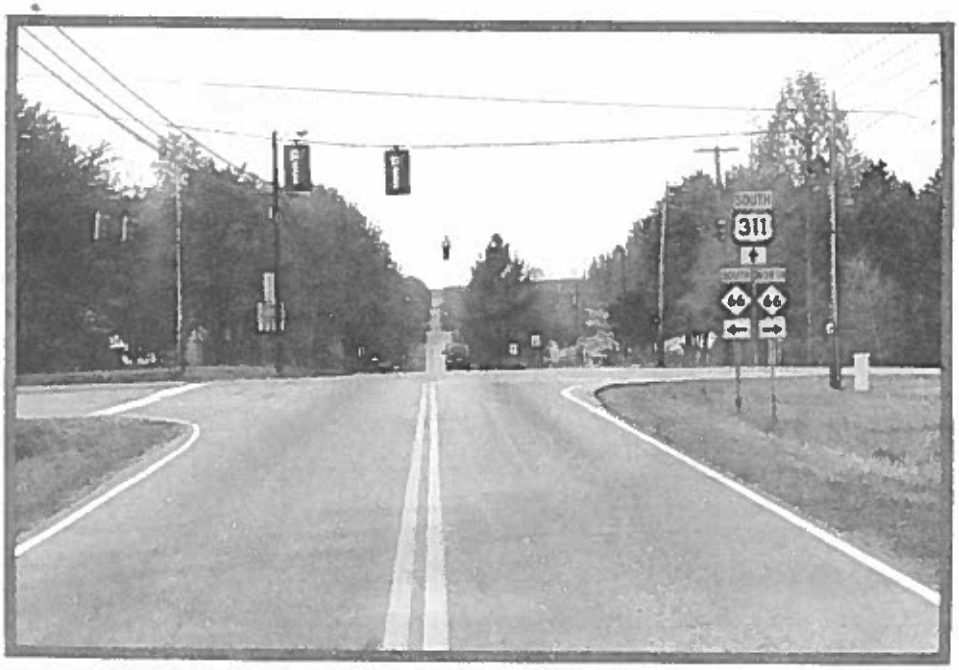


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

US 311
From the South City Limits of Walkertown
To US 220 Bus./NC 704 in Madison
Forsyth, Stokes, and Rockingham Counties
Transportation Improvement Program Project R-2313

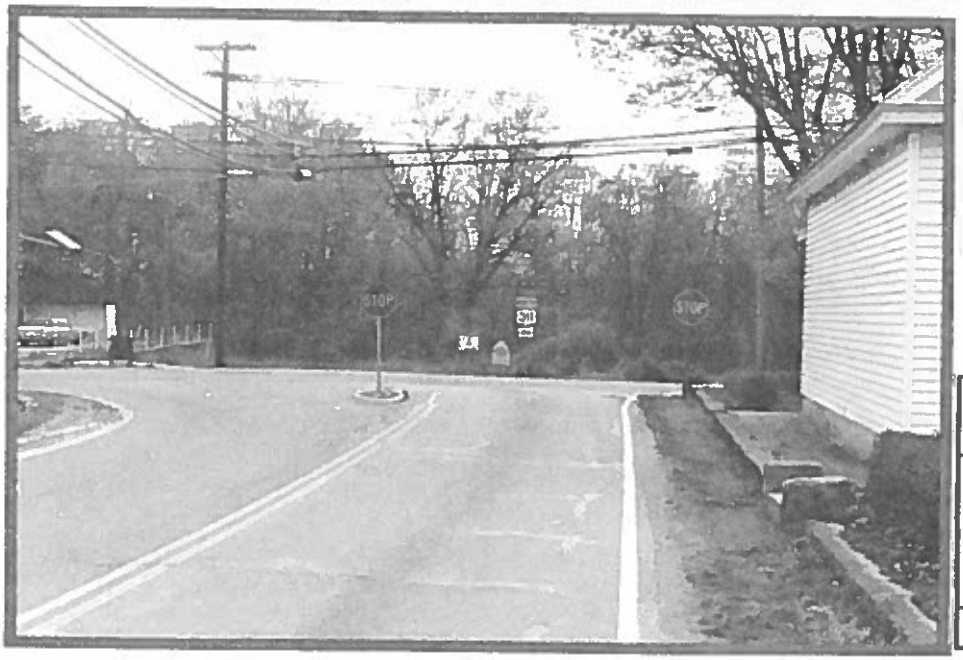
8/88 AES

FIGURE 1



LOOKING SOUTH TOWARDS NC 66 JUNCTION NEAR BEGINNING OF PROJECT

LOOKING NORTH IN WALKERTOWN TOWARDS US 311-SR 1998 INTERSECTION



LOOKING EAST ON US 311 IN WALKERTOWN TOWARDS SR 2002 INTERSECTION

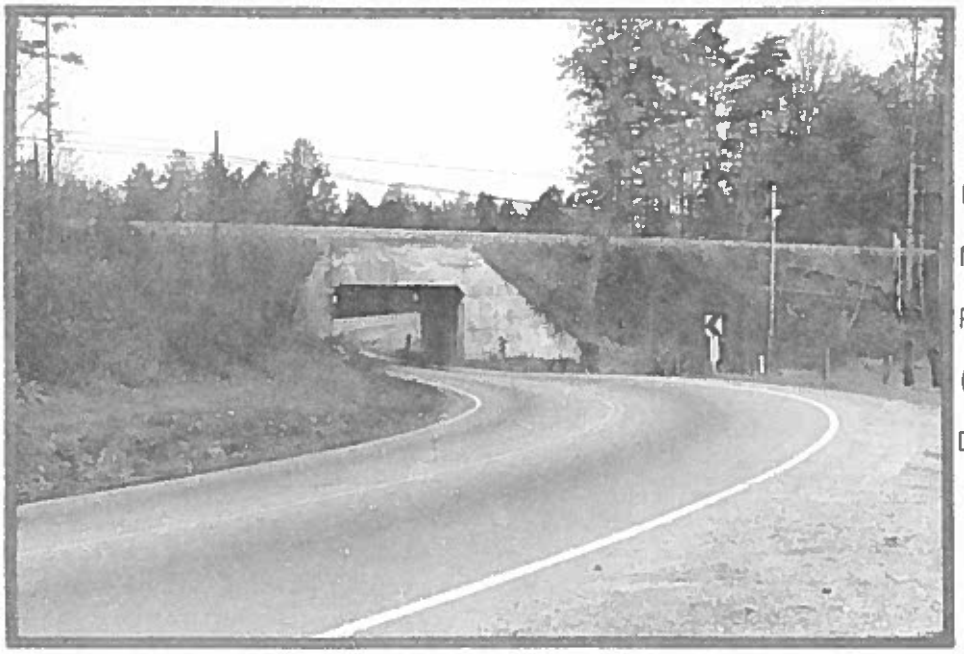
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

Photos of Existing Conditions
Along US 311

Project R-2313
Feasibility Study

6/88 AES | Figure 2-A

LOOKING NORTH TOWARDS BEGINNING OF 32-DEGREE CURVE JUST NORTH OF WALKERTOWN



LOOKING NORTH TOWARDS NORFOLK-SOUTHERN RAILROAD BRIDGE (LOCATED WITHIN 32-DEGREE CURVE)

LOOKING SOUTH NEAR SR 1950 (MABE ROAD)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

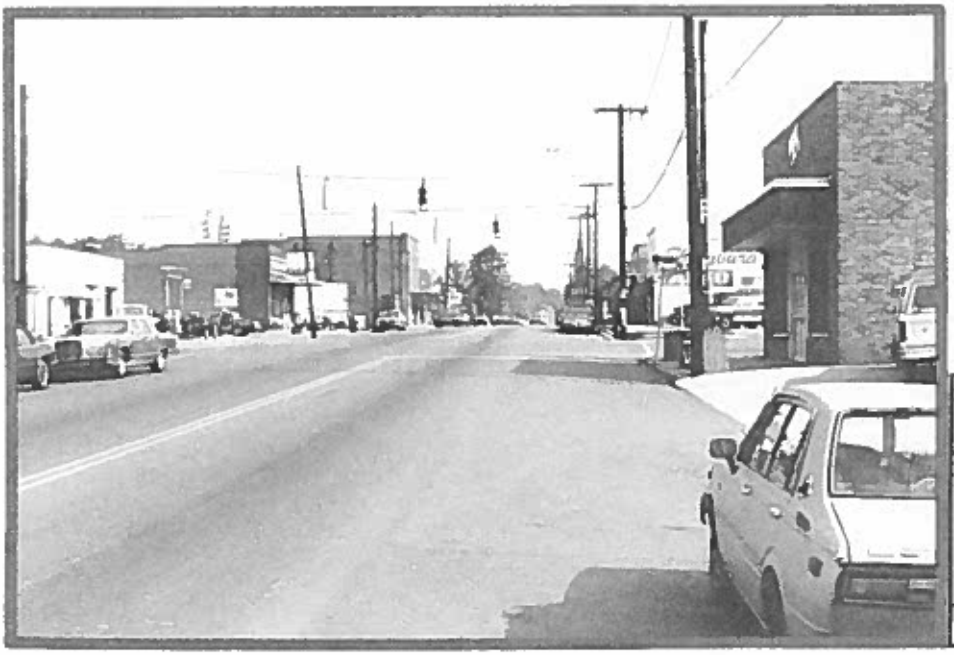
Photos of Existing Conditions
Along US 311

Project R-2313
Feasibility Study

6/88 AES | Figure 2-B

LOOKING SOUTH NEAR FORSYTH\STOKES COUNTY LINE

LOOKING NORTH TOWARDS US 311\NC 65 JUNCTION INSIDE WALNUT COVE



LOOKING NORTH IN WALNUT COVE TOWARDS US 311 (MAIN ST.)\ THIRD ST. INTERSECTION

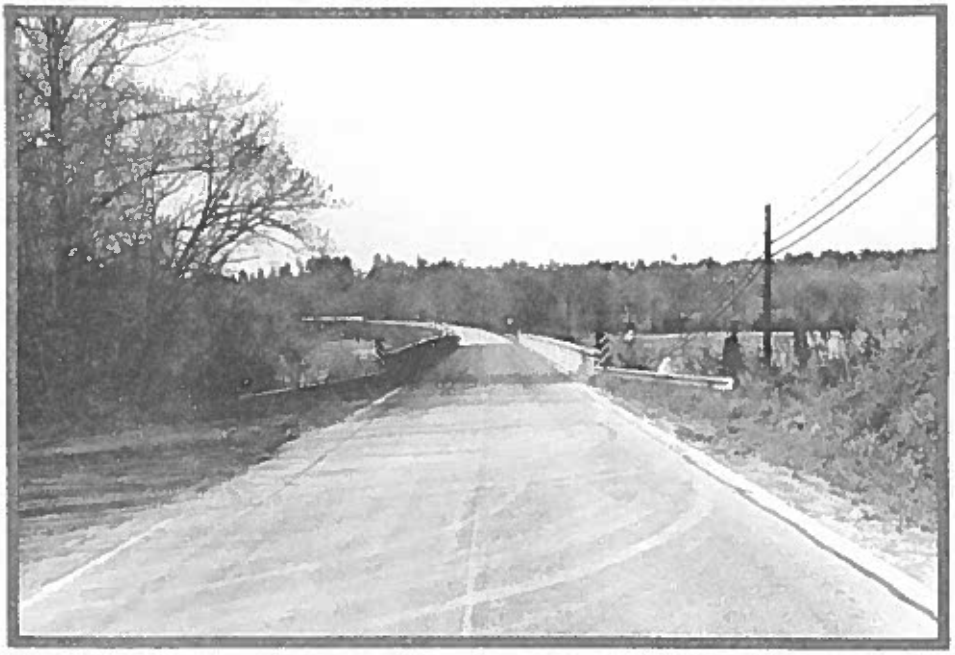
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

Photos of Existing Conditions
Along US 311

Project R-2313
Feasibility Study

6/88 AES | Figure 2-C

LOOKING NORTH TOWARDS
US 311\NC 89 JUNCTION
IN WALNUT COVE



LOOKING SOUTHWEST TOWARDS
DAN RIVER BRIDGE

LOOKING NORTHEAST TOWARDS
US 311\NC 772 JUNCTION

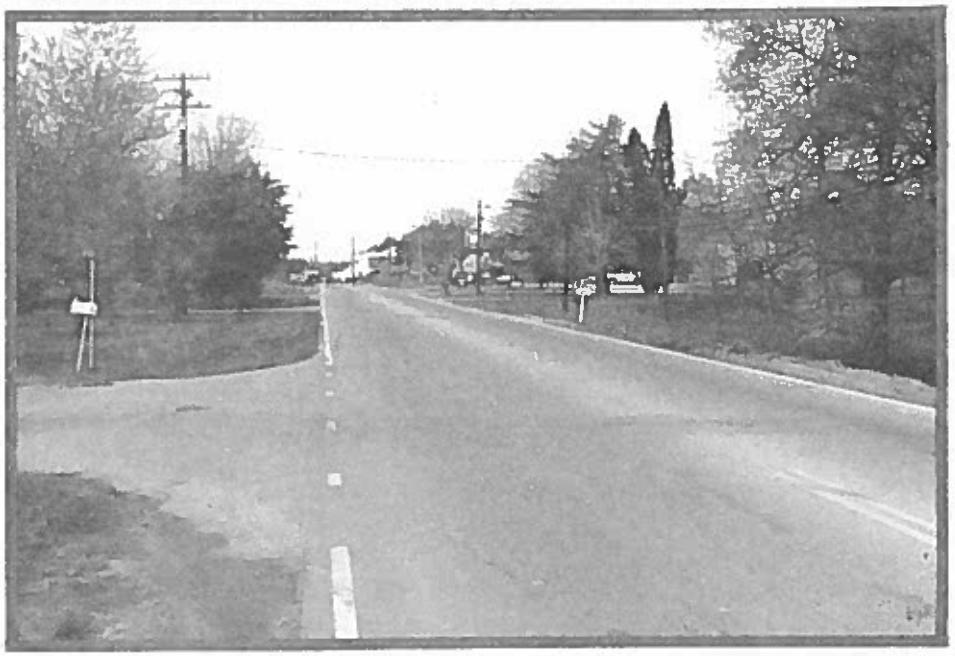
NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

Photos of Existing Conditions
Along US 311

Project R-2313
Feasibility Study

6/88 AES | Figure 2-D

LOOKING NORTHEAST NEAR STOKES\ROCKINGHAM COUNTY LINE



LOOKING SOUTHWEST IN MADISON NEAR POE STREET

LOOKING SOUTHWEST TOWARDS THE END OF PROJECT (US 311\ US 220 BUS.\NC 704 JUNCTION)

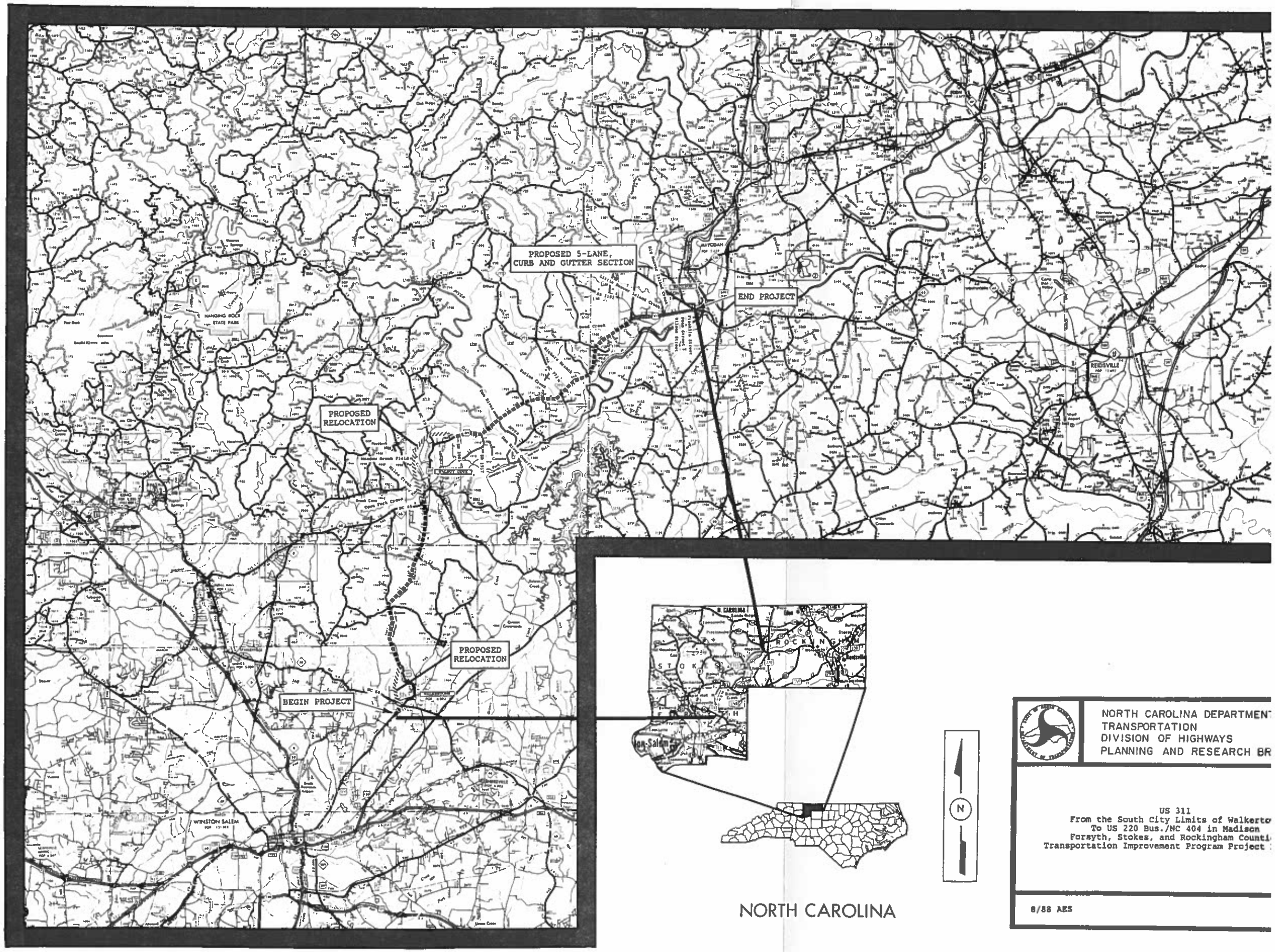
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

Photos of Existing Conditions
Along US 311

Project R-2313
Feasibility Study

6/88 AES

Figure 2-E


PROPOSED 5-LANE,
CURB AND GUTTER SECTION
END PROJECT
PROPOSED
RELOCATION
PROPOSED
RELOCATION
BEGIN PROJECT
HANGING ROCK
STATE PARK
WINSTON SALEM
REIDSVILLE
ROCKINGHAM
STOKES
FORSYTH
Winston-Salem
N
NORTH CAROLINA
NORTH CAROLINA DEPARTMENT
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BR
US 311
From the South City Limits of Walkerto
To US 220 Bus./NC 404 in Madison
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Transportation Improvement Program Project
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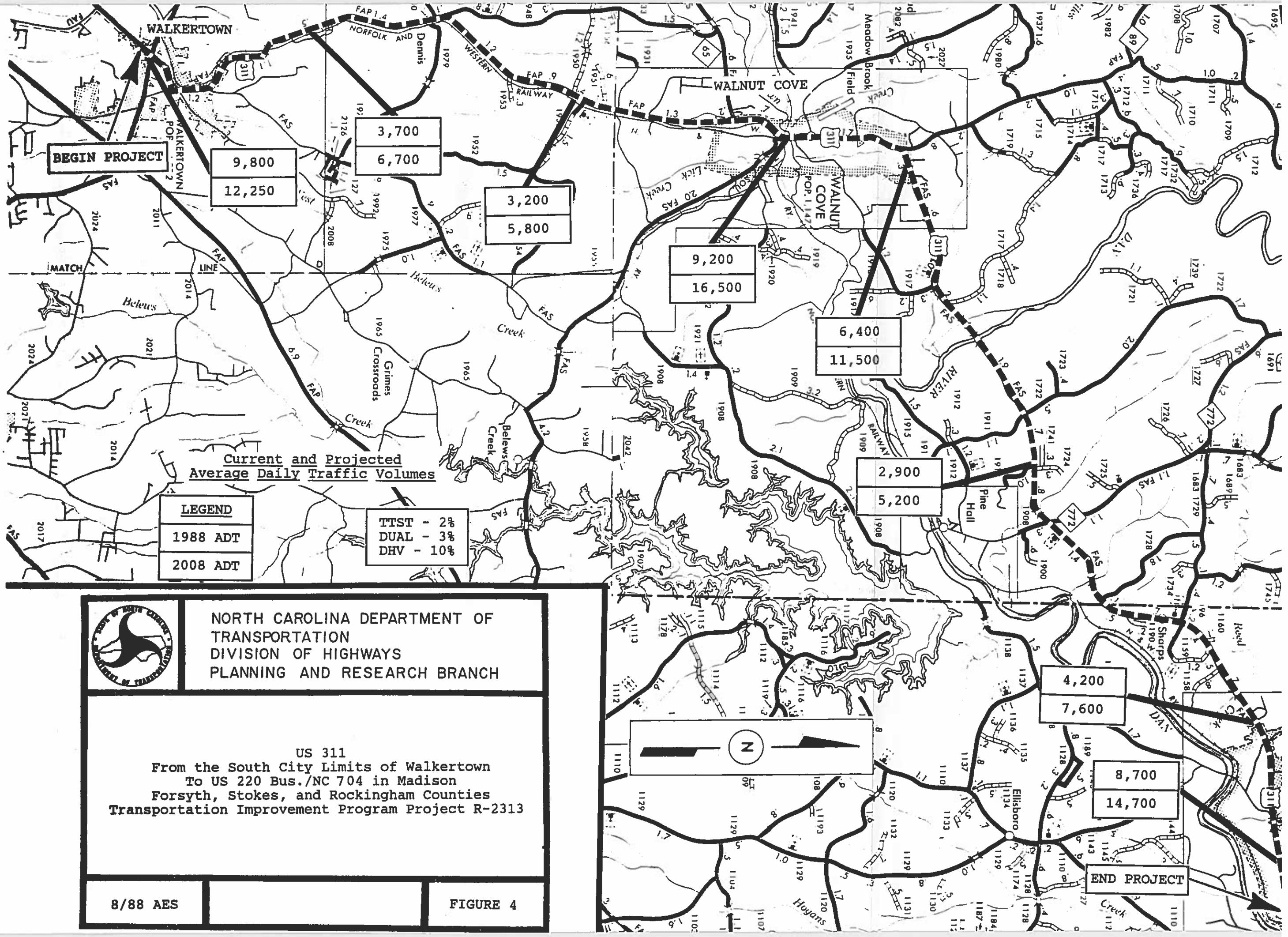
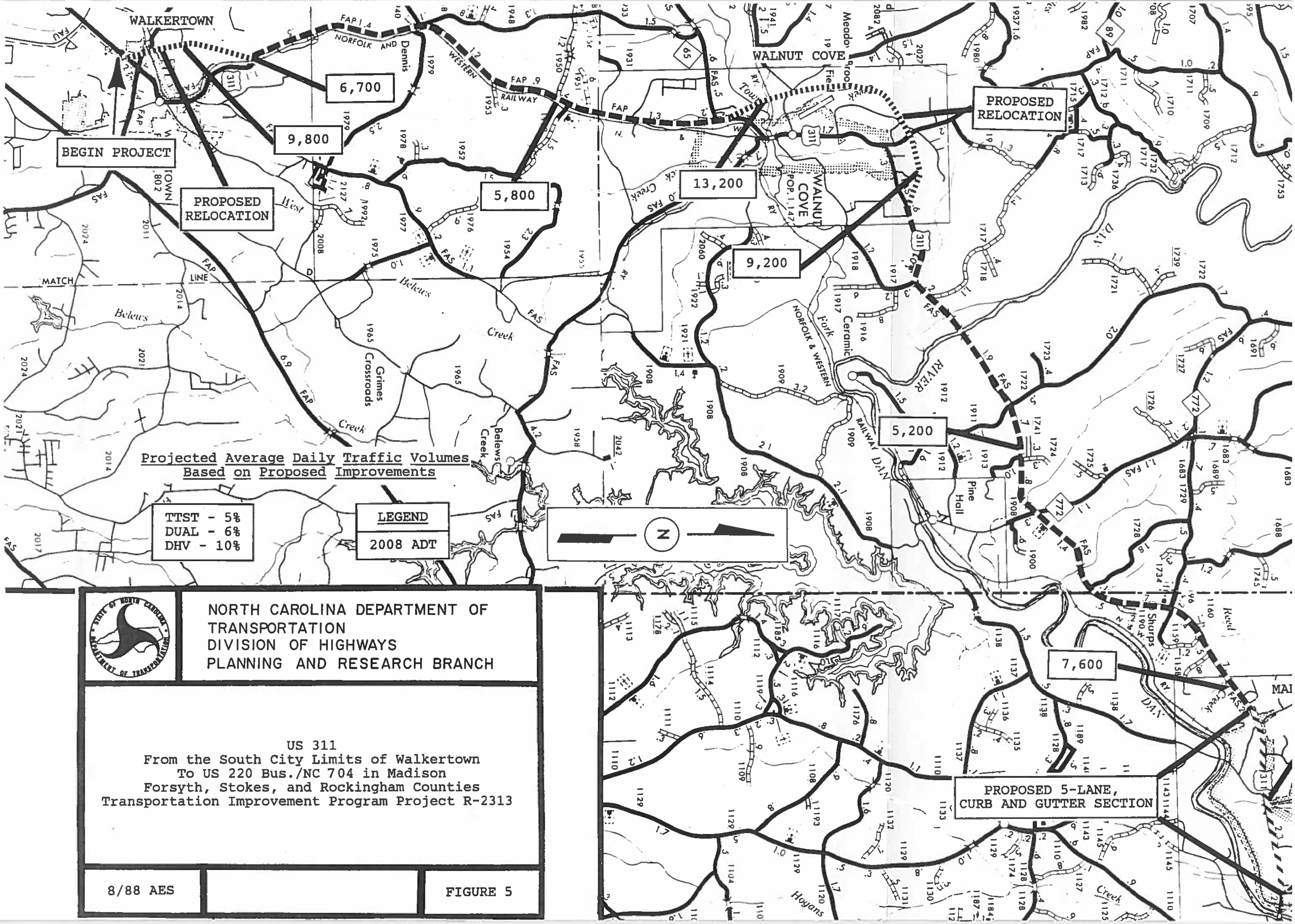


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

US 311
From the South City Limits of Walkertown
To US 220 Bus./NC 704 in Madison
Forsyth, Stokes, and Rockingham Counties
Transportation Improvement Program Project R-2313

8/88 AES

FIGURE 4



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

US 311
From the South City Limits of Walkertown
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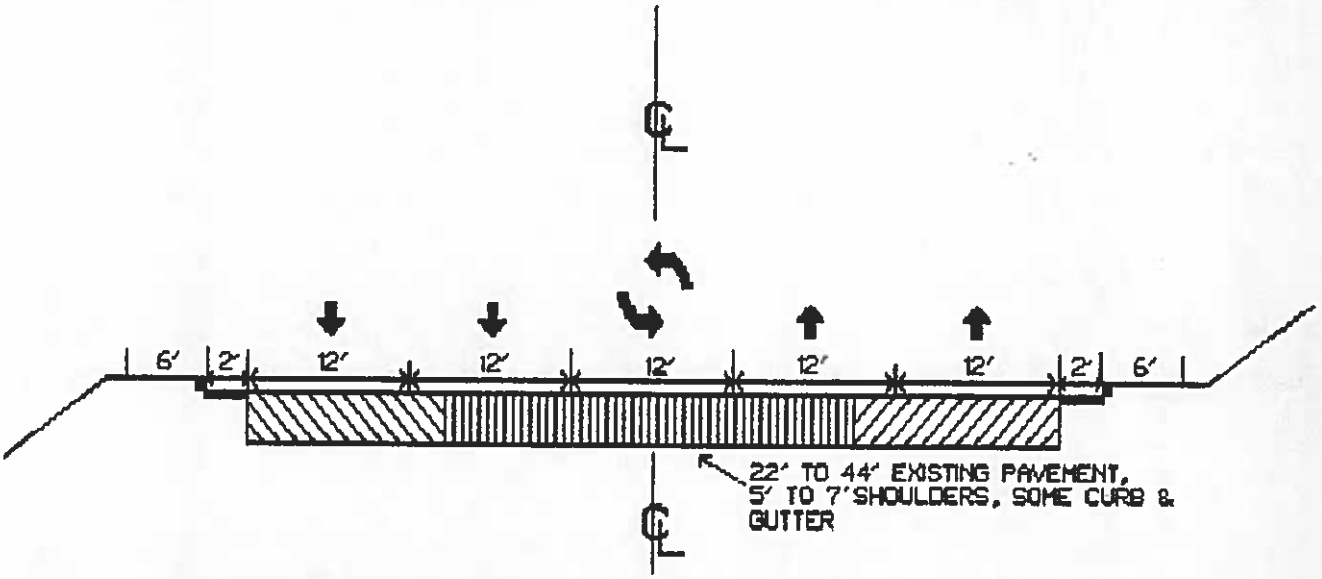
Forsyth, Stokes, and Rockingham Counties
Transportation Improvement Program Project R-2313

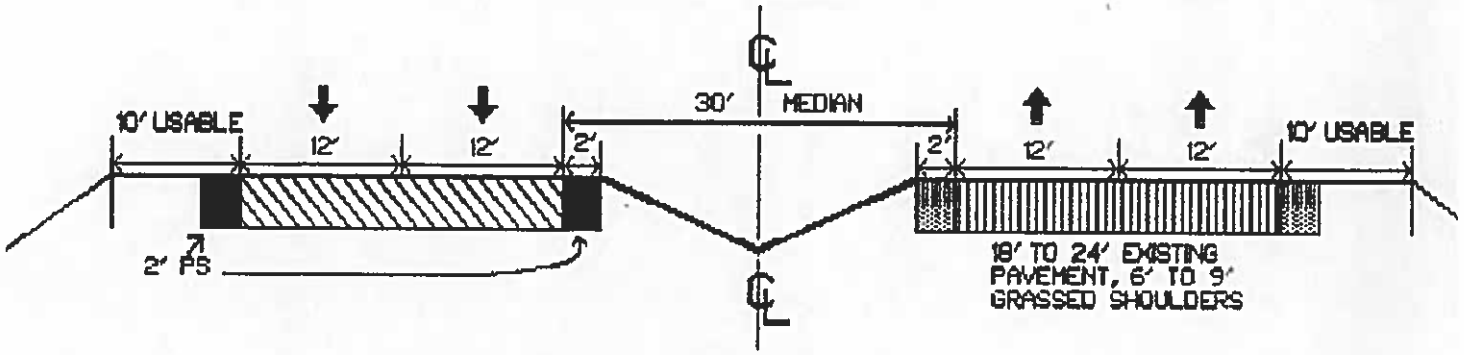
8/88 AES

FIGURE 5

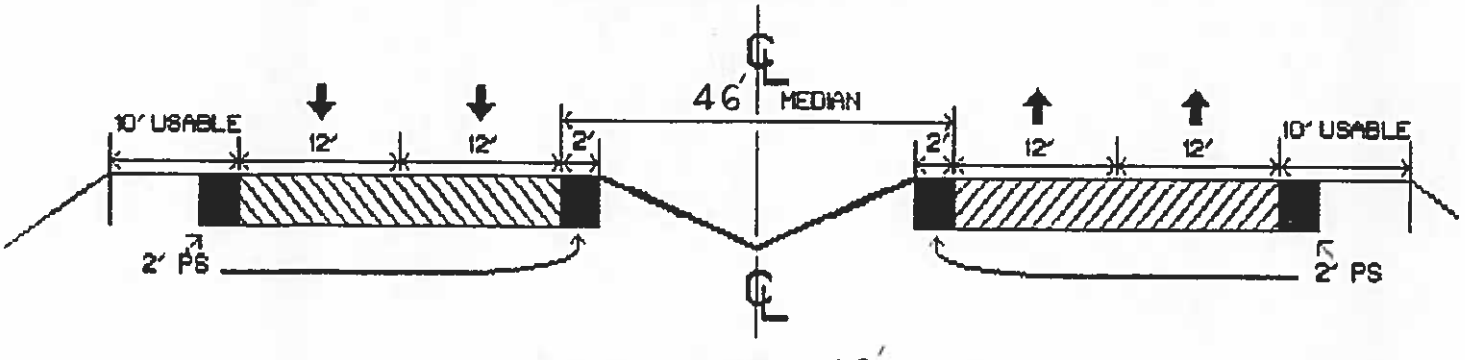
PROPOSED ROADWAY CROSS-SECTIONS *
PROJECT R-2313



WIDENING EXISTING TO 64' (FACE-TO-FACE) CURB & GUTTER INSIDE MADISON



ADDING 2 LANES WITH 30' MEDIAN
MAJORITY OF PROJECT



NEW 4 LANES WITH 46' MEDIAN
FOR WALKERTOWN AND WALNUT COVE BYPASSES

FIGURE 6

* FIGURES NOT DRAWN TO SCALE